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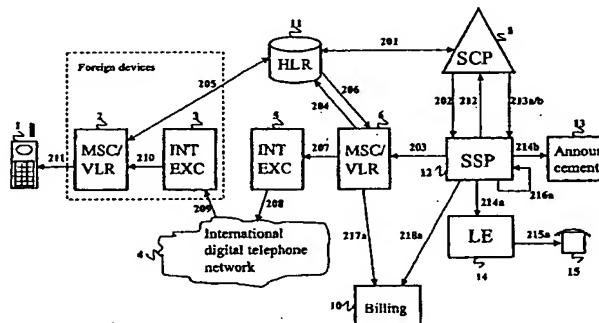
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(54) **Title:** METHOD FOR CREATING A CALL CONNECTION BETWEEN A MOBILE SUBSCRIBER AND A SECOND TELEPHONE SUBSCRIPTION IN RESPONSE TO A CONNECTION CREATION REQUEST MADE BY THE MOBILE SUBSCRIBER



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(57) **Abstract:** The invention relates to a method, in which a call connection is created between a customer's mobile station and some second telephone device, on the basis of a request sent by the customer. Such a method is used to provide a mobile subscriber, who does not know or remember the telephone number or network identifier of the destination subscription they wish, with an easy-to-use and cheap call connection service. When the customer wishes a connection to some number, they send a fixed-form message to a number stated by the mobile operator. This short message contains information, on the basis of which the destination subscription (15) can be determined. Having received the short message, the equipment of the mobile operator retrieves or selects the destination subscription. After this, the mobile operator calls the customer's mobile station. Once the customer has answered the call, the equipment of the mobile operator calls the destination subscription. Once this call has been answered, the equipment of the mobile operator links the call connections in such a way that a call connection is formed between the customer's mobile station and the desired number.

**METHOD FOR CREATING A CALL CONNECTION BETWEEN A MOBILE SUBSCRIBER AND
A SECOND TELEPHONE SUBSCRIPTION IN RESPONCE TO A CONNECTION CREATING
REQUEST MADE BY THE MOBILE SUBSCRIBER**

5 The present invention relates to a method, according to the preamble of Claim 1, for providing a mobile subscriber with a call-connection creation service.

10 Methods of this kind are used, or a method of this kind is used to provide a mobile subscriber with an easy-to-use and cheap call-connection creation service. The invention concerns a method, in which a call connection is created between the customer's mobile station and a second telephone subscription, on the basis of a request sent by the customer.

15 According to the state of the art, a mobile subscriber can use their mobile station to call a number they desire. If the mobile subscriber does not know or remember the number of the subscription they desire, the mobile subscriber can find out the number from, for example, service numbers or short-message services. The service-number service may also include the connection of the call to the number in question. The short-message services operate in such a way that, for example, the mobile subscriber sends a fixed-form short message to a specific number, when the service provider will retrieve or select the number on the basis of the information in the short message.

20 A drawback of the state of the art is that previous solutions have been quite inflexible from the customer's point of view, if the customer does not know or remember the number of the destination subscription. Finding the number with the aid of a service number or short-message service has been quite difficult and slow. From abroad, the use of such services 25 may not necessarily succeed at all, and is in any case expensive. The control logic of most service numbers is programmed in such a way that calls coming from abroad are blocked. This problem also concerns mobile subscribers, whose mobile subscription is connected to the network of a mobile operator other than their own mobile operator, i.e. the home operator. In other words, even mobile subscribers who are abroad and call from a domestic 30 mobile subscription cannot call service numbers in their home country that are subject to a charge, for example, directory enquiries numbers. ✓ // ✓

The invention is intended to create a method, with the aid of which a mobile communications customer can be provided with an easy-to-use, fast, and economical

service for forming a call connection to a telephone subscription, the precise network identity of which the customer either does not know, or does not remember.

5 The invention is based on a call connection, between a customer's mobile station and some second telephone subscription, the destination subscription, being formed by the action of the mobile operator, on the basis of a request by the customer. If a customer wishes a connection to some number, the customer sends a connection creation request, in the form of a fixed form short message, to a number stated by the mobile operator, or presents a call-creation request in some other manner. This request, for example, a short-message, 10 contains information and/or commands, on the basis of which the mobile operator retrieves or selects the correct destination subscription. After having received the request, the equipment of the mobile operator calls the customer's mobile station. Once the customer has answered the call, and the mobile operator has retrieved or selected the destination subscription, the equipment of the mobile operator calls the destination 15 subscription. Once this call has been answered, the equipment of the mobile operator links the call connections in such a way that a call connection is formed between the customer's mobile station and the destination subscription.

20 More specifically, the method according to the invention is characterized by what is stated in the characterizing portion of Claim 1.

25 In the method, the mobile subscriber can thus state the destination, to which they desire a connection, in other ways than as a telephone number. In preferred embodiments, the mobile subscriber can, for instance, send an SMS short message, which contains a specific command, or specific commands, as well as the name of the person or company to which they wish a connection. On the basis of the name, the mobile operator can retrieve the destination number, from, for example, a database. The database can be, for example a directory enquiries database, from which the desired telephone number can be retrieved on the basis of a name. The destination, to which a call connection is desired, can also be given 30 in such a way that, in addition to, or in place of the name of the person or company, for example, a postal address, Web address, e-mail address, or other information, on the basis of which the telephone number can be determined with the aid of some database, is stated. The mobile subscriber can then request the formation of a call connection, for example, by sending an SMS short message, which contains a specific command, or specific commands

and/or the Web address of the company to which they desire a connection. In a second preferred embodiment the mobile subscriber can, in addition, define their own abbreviated dialling codes, which relate to some telephone number. These abbreviated dialling codes can be recorded; for example, in a database maintained by the mobile operator. For 5 example, the mobile subscriber can record their own home number and entitle it with the code 'home', in which case the mobile subscriber can form a call connection to their home number by sending a request, which includes the code 'home'.
✓

In certain embodiments, the mobile operator can also select the destination number on the 10 basis of information given by the customer or appearing in some other way and/or on the basis of a command given by the customer. The mobile subscriber can, for instance, send an SMS short message, which contains a specific command and information as to the country in which the mobile subscriber is located. On the basis of this, the mobile operator forms a call connection between the mobile subscriber and the service number, from which 15 information is available on the prices of mobile service in the country in question.

Correspondingly, the mobile subscriber can state the name of the foreign mobile operator, to the mobile network of which the mobile station of the mobile subscriber is connected, in 20 which case the mobile operator can form a call connection to the corresponding service number. Information on the country of the location of the mobile subscriber or on the foreign mobile operator used by them can also be transmitted, for example, in the header data of an SMS short message. The equipment of the mobile operator, for example, an SCP, can also retrieve information from an HLR as to the country in which the mobile subscriber 25 is located, or which foreign mobile operator they are using. The embodiment can also be implemented in such a way that the call-connection creation request can include definitions and/or commands, on the basis of which the mobile operator forms a call connection to a suitable number.

Considerable advantages are gained with the aid of the invention.

30 With the aid of the invention, mobile subscribers can be provided with an easy-to-use and fast way to make a connection with a destination subscription, the telephone number or other network identifier of which is not known to the mobile subscriber. In the method, the network identifier of the destination subscription is retrieved or selected before the call connection is created, instead of it being retrieved or selected during the call connection.

Due to this, the total call time is shorter than when using service number according to the state of the art, so that it is cheaper for the mobile subscriber to utilize the method than to use service numbers.

5 The method is easier to use than short-messages services according to the state of the art, because the mobile subscriber needs neither to pick the destination subscription's number out of a short message, nor even to call the number themselves.

With the aid of the invention, it is possible to implement services that benefit the mobile subscriber. The mobile subscriber can, for instance, send an SMS short message, which contains the text 'interpreter Spanish', in which case the mobile operator will form a call connection to a Spanish-language interpreter. A service of this kind can be of great benefit to the mobile subscriber, if, for example, the language barrier is causing problems when dealing with officials.

15 In the following, the invention is examined with the aid of an example and with reference to the accompanying drawings. In the example, the method is divided into two sub-methods, which together form a totality acting as an example of the application of the invention. The sub-methods are shown in Figures 1 and 2.

20 In this application, the term domestic mobile operator refers to the mobile operator, with which the mobile subscriber has made a mobile subscription agreement. The domestic mobile operator is thus the entity that provides the mobile subscriber with mobile services and bills the mobile subscriber for these services. The term foreign mobile operator refers, 25 in the example, to a mobile operator with which the domestic mobile operator has made a co-operation agreement, for instance, a roaming agreement. On the basis of the co-operation agreement, the foreign mobile operator can, at the request of the mobile subscriber, or of the mobile station of the mobile subscriber, connect the customer's mobile subscription to the mobile network of the foreign mobile operator. The foreign mobile operator then bills the domestic mobile operator for the mobile services used by the mobile subscriber while the domestic mobile operator in turn bills the mobile subscriber for them. Through the agreement, the domestic mobile operator can provide its customers with an opportunity to use their mobile stations when abroad, though at a higher price than domestic services. Thus, the term foreign mobile operator need not refer to a foreign-
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owned mobile operator, or one that operates abroad, nor, correspondingly, need the term domestic mobile operator refer to a domestically-owned mobile operator, or one that operates in the home country. The term visited operator could also be used for a foreign mobile operator and, correspondingly, the term home operator for a domestic mobile operator.

For reasons of clarity, the operation of the digital mobile network, for example, a GSM or UMTS network, is not examined in detail in the example. If the invention is implemented in a GSM network, several network elements, which are not referred to in the example, are connected to the totality. Such elements are, for example, a GMSC (Gateway Mobile Switching Centre), a BSC (Base Station Controller), and a BSS (Base Station System). The structure and operation of the international digital telephone network are also not described. The details of the operation and implementation of these networks are not essential from the point of view of the invention. In addition, one versed in the art can be assumed to be familiar with the operation, implementation, and use of the relevant networks, and with their application to the extent required by the invention.

Joint operation of a connection service, implemented with the aid of the invention, and mobile operator's billing system, can be realized in several different ways. The example shows one manner of implementation, which is based on the use of so-called tickets to transmit charging bases. The term ticket refers to a fixed-form data packet, which contains data relating to the event in question, such as time, duration, price, and title of the service used.

25 In the example, the following internationally-recognized abbreviations are used:

MSC Mobile Switching Centre

SCP Service Control Point

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SSP Service Switching Point

HLR Home Location Register

VLR Visiting Location Register

LE Local Exchange

5 BCSM Basic Call State Model

FCI Furnish Charging Information.

10 Figure 1 shows a block diagram of a mobile subscriber's request to create a call connection, made using an SMS short message, and the operations relating to its processing.

Figure 2 shows a block diagram of the creation of the call connection requested by the mobile subscriber, and the related operations.

15 The system shown in Figure 1 includes the foreign operator's MSC 2, which is linked to a VLR, a foreign traffic centre 3 abroad, a mobile station 1 of a mobile subscriber in the coverage area of the MSC 2, a domestic foreign traffic centre 5, an international digital telephone network 4 connecting the foreign centres 3 and 5, a domestic operator's MSC 6, the domestic operator's SMS short-message centre 7, the domestic operator's SCP 8, the 20 foreign operator's billing system 9, and the domestic operator's billing system 10.

25 When processing, by means of the method according to Figure 1, a call connection creation request sent in an SMS short message form by a mobile subscriber, the following operations are carried out:

101. The mobile subscriber uses their mobile station to send an SMS short message to the number stated by the domestic mobile operator, as a result of which the mobile station 1 sends an SMS short message to the MSC 2 of the foreign operator. The SMS short message contains information, on the basis of which the destination subscription can be selected or retrieved. This information can include, for example, a command, name, address, and/or keywords.
102. The MSC 2 sends an SMS short message in a signalling channel to the foreign traffic

centre 3 of a suitable foreign operator.

103. and 104.

5 The foreign traffic centre 3 sends the SMS short message to the foreign traffic centre 5 of the domestic mobile operator, through the international digital telephone network 4.

10 105. The foreign traffic centre 5 sends the SMS short message to the MSC 6 of the domestic operator.

106. The MSC 6 sends the SMS short message to an SMS short message centre 7.

15 107. The SMS short message centre 7 sends an SMS short message to an SCP 8. The SCP 8 picks the information, on the basis of which the destination subscription can be retrieved or selected, from the contents of the short message. The SCP 8 also obtains the mobile subscriber's A-subscriber number identity, i.e. the telephone number of the mobile subscriber's mobile subscription, from the header data of the SMS short message.

20 108. The MSC 2 of the foreign mobile operator makes a billing ticket for the sending of the SMS short message and sends it to the billing system 9 of the foreign mobile operator, which records the ticket.

25 109. The billing system 9 of the foreign mobile operator sends the information of the mobile services used by the mobile subscriber to the billing system 10 of the domestic mobile operator and bills the domestic operator for the mobile services used by the mobile subscriber. The billing system 10 of the domestic mobile operator records the information it receives and adds the billing information to the billing account of the mobile subscriber. The mobile subscriber is billed on the basis 30 of the billing account.

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The system shown in Figure 2 includes, as in Figure 1, an MSC 2 of a foreign operator, in connection with which there is a VLR, a foreign traffic centre 3 abroad, the mobile subscriber's mobile station in the coverage area of the MSC 2, a domestic foreign traffic

centre 5, the international digital telephone network 4 connecting the foreign centres 3 and 5, the domestic operator's MSC 6, the domestic operator's SCP 8, and the domestic operator's billing system 10. In addition to these devices, the system of Figure 2 includes the domestic mobile operator's HLR 11, SSP 12, and announcement equipment 13, as well 5 as the telephone network's LE 14 and the telephone device 15 of calling subscriber of the telephone network.

When using the method according to Figure 2 to create a call connection requested by a mobile subscriber, the following operations are carried out:

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201. The SCP 8 retrieves, from the HLR 11, data concerning to which foreign mobile operator's mobile network the mobile station of the mobile subscriber is connected. On the basis of the information given in the call-connection creation request, the SCP 8 retrieves or selects the network identifier of the destination subscription, for 15 example, from a database or databases. (The SCP can also carry out a retrieval or selection with the aid of some other device.) If the destination number is a service number subject to a charge, the SCP 8 also retrieves from the HLR subscriber register information as to whether the mobile subscriber has switched on a service block to service numbers subject to a charge.

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202. The SCP 8 sends the SSP 12 an ICA (Initiate Call Attempt) message and a Continue message. The telephone number of the mobile subscriber is given in the Destination-Routing-Address field of the header of the ICA message and at the same time the SCP 8 commands the SSP 12 to set an EDP (Event Detection Point) in the RRB (Request Report BCSM) format to monitor the answer sign of the 25 ✓mobile subscriber. A detection point DP7-R (Detection Point 7 - Request) can be used for this purpose. In connection with this, the SSP 12 can also be sent an FCI message defining a ticket.

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203. The SSP 12 sends, on the basis of the ICA message, a procedure call to the MSC 6 of the domestic mobile operator. (At this stage, reverse-charge calls can be separated from the other calls coming from the mobile subscriber; for example, by adding some prefix to the call number originating from the SSP 12, or by altering some other field in the initiation address message. In that case, the MSC 6 of the

domestic mobile operator can identify and ticket the call, so that it becomes free of charge in the billing system from the point of view of the mobile subscriber, or in such a way that it is billed at some other rate, or on some other basis than is the practice in the case of receiving normal calls abroad.)

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204. The MSC 6 sends a query to the HLR 11 to determine the so-called roaming number of the mobile subscription. On the basis of the roaming number, the call can be routed to the mobile subscriber's mobile subscription in the network of the foreign mobile operator.

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205. The HLR 11 sends a query to the VLR of the foreign mobile operator's MSC 2, in the area of which it knows the mobile subscriber's mobile station to be. The VLR responds to the HLR 11 by providing the mobile subscriber's roaming number.

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206. The HLR 11 sends the mobile subscriber's roaming number to the domestic mobile operator's MSC 6.

207. On the basis of the roaming number of the mobile subscription, the domestic mobile operator's MSC 6 channels the call connection to a suitable foreign centre 5.

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208. and 209.

The domestic foreign traffic centre 5 channels the call connection further through the international digital telephone network 4 to the foreign traffic centre 3 abroad.

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210. The foreign traffic centre 3 abroad channels the call connection further to the foreign mobile operator's MSC 2.

211. On the basis of the data in the VLR, the foreign mobile operator's MSC 2 channels the call connection to the mobile subscriber's mobile station 1, through the correct BSC and BSS. When the mobile subscriber answers the call, an answer signal is transmitted back to the home country, as far as the SSP 12.

212. The SSP 12 reports, by means of an ERB message (Event Report BCSM), to the SCP 8 that the mobile subscriber has answered.

VV

If the destination number is a service number subject to a charge, either operations 213a - 219a, or 213b and 214b are carried out, depending on whether the mobile subscriber has switched on a service block for service numbers subject to a charge, or not. Operations 5 213a - 219a are carried out, if the service block for service numbers subject to a charge is not switched on. Operations 213b and 214b are carried out, if the customer has switched on the service block for service numbers subject to a charge, or if the provider of a free service number does not permit calls from abroad.

10 213a) The SCP 8 sends the SSP 12 a call connection operation (Connect), which includes information on the mobile subscriber's mobile subscription number (calling subscriber number) and the destination number, to which the mobile subscriber wishes a connection.

15 214a) On the basis of the call connection operation, the SSP 12 channels the call connection to the domestic LE 14, in such a way that the mobile subscriber's mobile subscription number (calling subscriber number) is transmitted to the LE 14, during the creation of the call connection.

20 215a) The LE 14 connects the call connection coming from the SSP to the telephone device 15 of the telephone network subscriber, on the basis of the destination number, in such a way that the mobile subscriber's mobile subscription number (calling subscriber number) is forwarded to the telephone device 15 during the creation of the call connection. Once the telephone device 15 has answered the transmitted call, notification of this is sent to the SSP. The telephone network subscriber can be, for instance, the service provider of a service number.
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30 216a) The SSP 12 forms a call connection between the domestic subscriber's telephone device 15 and the mobile station 1 of the mobile subscriber who is abroad. It is possible to send an FCI message defining a ticket to the SSP, at this time as well.

217a) The MSC 6 creates a ticket from the call connection and sends it to the billing system 10, which records the information relating to the ticket. The price of the ticket can depend, for example, on the duration of the call connection.

218a) If the call connection is to a service number subject to a charge, the SSP 12 creates a ticket for the use of the service number subject to a charge and sends it to the billing system 10, which records the information relating to the ticket. The price of this ticket can depend, for example, on the per-call price of the service number, or on the duration of the call connection.

5 219a) (Not shown in the figure.) If the call connection is to a service number subject to a charge, or to a conventional telephone subscription, the billing system 3 records the information it receives and transfers the relevant billings to the billing account of the mobile subscriber. The mobile subscriber is billed on the basis of the billing accounts. Different billings and their related data can be itemized in the bill. 10 Because the call connection to a mobile subscription located in the network of a foreign mobile operator is formed through the actions of the domestic mobile operator, billing also takes place directly through the actions of the domestic mobile operator. Account balance service according to the state of the art can then be kept 15 up to date in a manner corresponding to that used in the case of calls made from the network of the domestic mobile operator. Account balance services are implemented using known technology.

20 213b) The SCP 8 sends the SSP 12 a call connection operation (Connect), which contains instructions to create a connection to the signalling device 13.

25 214b) The SSP 12 creates a connection to the signalling device 13 and links the call connections in such a way that a call connection is formed between the signalling device 13 and the mobile station 1 of the mobile subscriber who is abroad. The announcement device states the reason for the failure of the call, by means of a voice announcement.

30 Embodiments of the invention, differing from those disclosed above, can also be contemplated. The apparatuses shown in the figures and the examples are not the only technical means with the aid of which an embodiment of the invention can be implemented. The embodiments of the invention can be implemented by means of techniques and systems differing from the figures and examples.

In the example, a connection is formed between the mobile subscriber's mobile station and a telephone device of a fixed telephone network. The method according to the invention can, however, also be used, for instance, to create a call connection between two mobile stations.

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The call connection between the mobile subscriber's mobile station 1 and a telephone device 15 of a telephone network can be formed in a manner differing from the example, for instance, in such a way that call is not connected through a local telephone exchange 14, but by using some other technique. The service number provider can be, for example, the relevant domestic mobile operator, in which case the call connection can be connected directly to the equipment of the service-number system.

The call connection being formed can be used not only for voice communication, but also for other purposes, such as data transmission.

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An application according to the invention can be implemented with the aid of several different mobile technologies, for example, the UMTS (Universal Mobile Telecommunications System), or GPRS (General Packet Radio Service) technologies. The call connection creation request can be sent, for example, within the framework of WAP (Wireless Application Protocol) technology.

The invention can also be applied in such a way that the mobile subscriber makes a call connection creation request by using their mobile station to call a specific number. In that case, the identification of the mobile subscriber can be carried out with the aid of, for example, a username and password. The mobile subscriber can give their username and password, for example, by keying in the relevant number combinations on their mobile station during the call.

If the mobile subscriber requests the creation of a connection to a service number subject to a charge, despite the fact that the mobile subscriber has switched on a service block for service numbers subject to a charge, the customer can be sent, for example, an SMS short message stating that the connection cannot be created. Notification can also be sent, for example, if the service provider of a free number does not permit calls coming from abroad.

With the aid of the method, various interfaces can be used to make the service implemented easier for the customer to use. For example, the WAP browser of the mobile station can be utilized to send the connection creation request, in which case the mobile subscriber can be identified, for example, with the aid of a username and password. The mobile subscriber
5 can present a connection creation request, for instance, by entering data related to the desired destination number, in a text field of a WAP page and sending this to the mobile operator, with the aid of the WAP browser of their mobile station. In addition, the mobile station's interface can, for example, be programmed to send SMS short messages with a specific content, when speeddialling keys are pressed. The interface can also be
10 programmed in such a way that specific information, such as location data or information on the foreign mobile operator being used, is automatically added to SMS short messages sent to the mobile operator.

Some entity other than a mobile operator can also use or provide the method according to
15 the invention.

The invention can also be used with the aid of some other message technology, for example, with the aid of USSD (Unstructured Supplementary Service Data) messages. A connection creation request can be, for example, sent and/or received in the form of, or
20 with the aid of a USSD message.

The example shows one alternative billing procedure, but in the various embodiments of the invention billing can be carried out in different ways. For example, billing can be carried out in such a way that a ticket for the service is made in the MSC, through the operation of the SSP and/or some other device. The mobile operator can implement its billing in a manner differing from the example. The billing system can, for instance, be outsourced, in which case a subcontractor of the mobile operator carries out the operations relating to billing. In the example, the billing information is transmitted to the billing system through tickets. Data communications between the various apparatuses of the mobile system and the billing system can, however, be implemented in a manner differing from the example.
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The billing of the mobile subscriber can also take place by sending an FCI message defining the ticket, from the SCP to the SSP in connection with sending an ICA (Initiate Call Attempt) message or a Connect message. The ticket created is transferred to the billing

system.

The method can also be used to provide the customer with a service, in which case the service can be used to provide the customer with an easy way to call their home country using their mobile station. To use the service, the customer only needs to write information related to the destination subscription they wish in a short message and send it to a specific number. The customer's use of a service based on the invention need not depend on their language skills. In addition, the service operates in the same way in all countries, the short message being sent to the same number, irrespective of the country. The service is also relatively fast, as the customer does not need to talk with a customer-service employee or listen to instructions for an automated service. Thus, the customer can be offered, for example, mobile connections between abroad and home, which are cheaper than conventional calls from abroad made using a mobile station. This advantage is due to the present GSM call charging practice, in which it is clearly (about 25 - 60 %) cheaper to receive calls to a GSM telephone abroad than it is to use a GSM telephone to make a call from abroad to the home country.

The method can also be used to resolve problems relating to account balance services. The term account balance service refers to a service, by means of which a customer is informed of the call charges that have accumulated to their account during a billing period. Customers who use account balance services experience the problem in the state of the art that the account balance service is not up to date. Information on GSM calls made from the home country is updated in an account balance service with a delay of about 2 - 3 days, so that the GSM subscriber remains informed of the growth of their telephone bill. Because GSM calls made abroad in a conventional manner and the related billing data are received by the GSM subscriber's own operator with a delay of two or even three weeks, in such cases the call balance service can no longer remain up to date. If the GSM subscriber uses their telephone particularly often abroad, the balance information service is of no practical benefit to them. When using the method based on the invention, a mobile operator can provide its customers with balance services that remain up to date, even in the case of connections made from abroad. The method based on the invention permits balance services to be updated with a delay of about 2 - 3 days, because the domestic mobile operator carries out the operations relating to billing.

With the aid of an embodiment of the method, a mobile operator can also provide, for example, company customers with the possibility to offer free service numbers, which are free of charge to customers, even when they are calling from abroad. If the company customer agrees to pay the expenses arising from calls made from abroad, the mobile operator can bill the company customer, instead of the mobile subscriber, for the call connection. In this way, a service provider can provide a service that is completely free of charge, even to mobile subscribers who are located abroad. If desired, the expenses arising from the sending of the connection creation request (e.g., sending an SMS short message) can also be billed to the company customer. The billing of expenses relating to the presentation of a connection creation request, for example the expenses of sending an SMS short message, can be implemented in, for instance, the following manner:

- The SCP compares the destination number selected or retrieved on the basis of the call-connection creation request with the data in the database. The SCP then notes that the destination number is a free service number, the service provider of which has agreed to pay all expenses relating to a connection being made to the service number.
- The SCP makes a ticket, on the basis of which the billing system bills the service provider for the expenses arising from the call-connection creation request, such as the expenses arising from sending an SMS short message from abroad.
- The SCP makes a ticket, on the basis of which the expenses arising from the call-connection creation request, such as the expenses arising from sending an SMS short message from abroad, are deducted from the customer's billing account. With the aid of this ticket, the ticket previously sent by the foreign mobile operator (in operation 109 of the example) is cancelled. The ticket can include identifier data, on the basis of which it can be linked to the ticket sent previously (in operation 109 of the example).

The method can be applied in such a way that the mobile operator identifies a mobile subscriber who has sent a connection creation request, for example, on the basis of header data, or on the basis of the content of a short message. The mobile operator can then connect the call connection in such a way that the call's Called subscriber is informed of the subscription number of the customer, i.e. the Calling subscriber. The advantage of this embodiment is that, with the aid of the method, the customer can be provided with the

opportunity to call service numbers from abroad too. The invention also permits calls to service numbers, because, with the aid of the invention, the entity maintaining the service number can be informed of the subscription number of the customer's mobile station. Billing can be carried out because a ticket made by the SSP on the SCP's command may be used as a basis for the billing in addition to the ticket made by the MSC. Thus, in a call going to a service provider, it is now possible to transmit the Calling subscriber's number identity in a manner corresponding to that used in service number calls made in the home country. The display of the Calling subscriber number identity can, however, be prevented, should this be necessary or mandatory due to the nature of the service in question. With the aid of the embodiment, a mobile subscriber who is abroad, for instance, can be provided with a possibility to contact such numbers, in which the origin number of incoming calls is checked and/or in which calls coming from unidentified numbers are blocked. Examples of such numbers are certain service numbers of banks. Because, through the embodiment, the Called subscriber is informed of the Calling subscriber number, the Called subscriber can check from which subscription the call has originated. This is advantageous, for example, if an employee of a company who is travelling calls the company's office to ask about matters relating to some project. On the basis of the Calling subscriber number, the office can ensure that the call has originated from the subscription of the company's employee, and not, for example, from the subscription of an industrial spy for a competing company.

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The example shows a situation in which the mobile subscriber is located abroad, in the coverage of a foreign mobile operator's network. The method can, however, also be used when the mobile subscriber is in their home country and/or in the network of a domestic mobile operator.

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The invention can be applied in such a way that, besides creating a call connection, the mobile subscriber is sent, for example, a short message, which contains the network identifier, such as the telephone number, of the retrieved or selected destination subscription. This has the advantage that the mobile subscriber can, if they wish, later make a direct call to the destination subscription.

30

Claims:

1. A method for creating a call connection between a mobile subscriber and a second telephone subscription, the destination subscription (15), in response to a connection creation request made by the mobile subscriber, which includes information for defining the destination subscription, which information comprises information other than the exact network identifier of the destination subscription

characterized in that, in the method

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-a connection creation request directed to an intelligent network telephone service, which includes the network identifier of the mobile subscription of the mobile subscriber, such as a telephone number, and information for defining the destination subscription (15), is received from the direction of the mobile subscriber,

15

-the mobile subscriber's mobile subscription (1) is called and a call connection is opened to it,

20

-the destination subscription (15) is retrieved and/or selected at least with the aid of the information, for defining the destination subscription (15), given in the connection creation request,

25

-the destination subscription (15) is called and a call connection is opened to it, the opened call connections are linked in such a way that a call connection is formed between the customer's mobile station (1) and a telephone device (15) or terminal device according to the destination number.

30

2. A method according to Claim 1, characterized in that the network identifier is a telephone number.

3. A method according to either Claim 1 or 2, characterized in that the connection creation request is received in the form of, or through an SMS (Short Message Service)

short message.

4. A method according to either Claim 1 or 2, characterized in that the connection creation request is received in the form of, or through a USSD (Unstructured

5 Supplementary Service Data) message.

5. A method according to any of Claims 3 - 4, characterized in that the information for defining the destination subscription (15) appear in the contents field of the message.

10 6. A method according to any of Claims 3 - 5, characterized in that the network identifier of the mobile subscription (1) of the mobile subscriber appears in the header field of the message and/or the contents field of the message.

15 7. A method according to any of Claims 1 - 6, characterized in that information is sought concerning the location within the mobile network of the mobile subscription (1) of the mobile subscriber and that the destination subscription (15) is retrieved and/or selected from the database, with the aid of the information given in the connection creation request to define the destination subscription (15) and of the location information of the mobile subscription of the mobile subscriber.

20 8. A method according to any of Claims 1 - 7, characterized in that the connection creation request is received through a data call or other data connection, for example, from a mobile station supporting WAP (Wireless Application Protocol) technology.

25 9. A method according to any of Claims 1 - 8, characterized in that the information provided to determine the destination subscription includes predefined commands.

30 10. A method according to any of Claims 1 - 9, characterized in that the owned, possessor, and/or user of the destination subscription is billed for a certain sum on the basis of the connection creation request sent by the mobile subscriber and/or of the call connection formed.

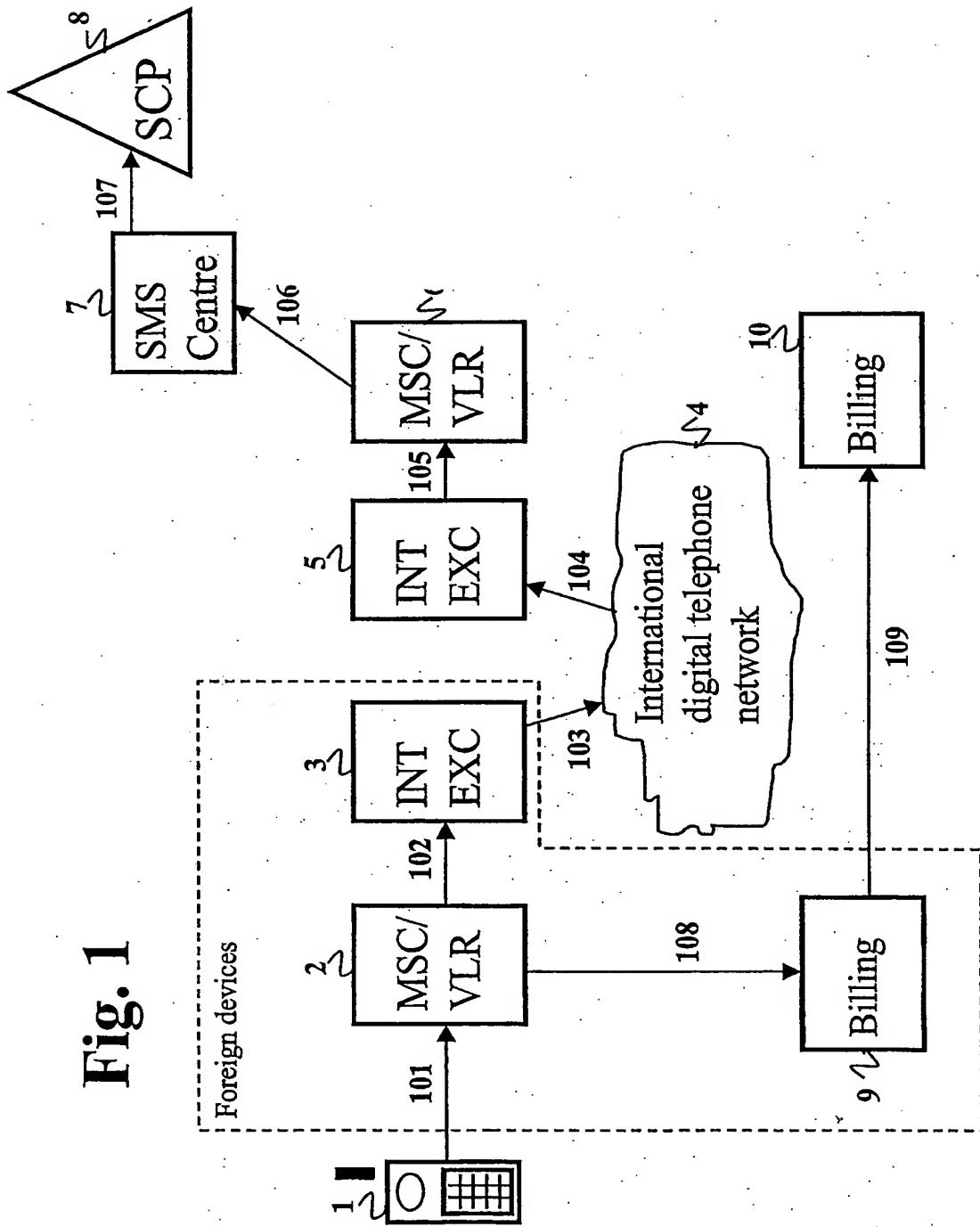
11. A method according to any of Claims 1 - 10, characterized in that the entity, which is billed for a certain sum on the basis of the connection request sent by the mobile subscriber

and/or of the call connection formed, is determined on the basis of the destination subscription and/or of the network identifier of the destination subscription.

12. A method according to any of Claims 1 - 11, characterized in that the information in
5 the connection creation request for determining the destination subscription comprises the network identifier of the destination subscription.

13. A method according to any of Claims 1 - 12, characterized in that the mobile subscriber has a mobile subscription agreement with the first mobile operator, and the
10 mobile subscription (1) of the mobile subscriber is connected to the mobile network of a second mobile operator.

14. A method according to any of Claims 1 - 13, characterized in that the information transmitted by means of the connection creation request for determining the destination
15 subscription (15) comprises information, such as names, postal addresses, Web addresses, and/or e-mail addresses relating to a natural person, a legal person, or some association, and that the destination subscription (15) is retrieved and/or selected from the database with the aid of this information.

Fig. 1

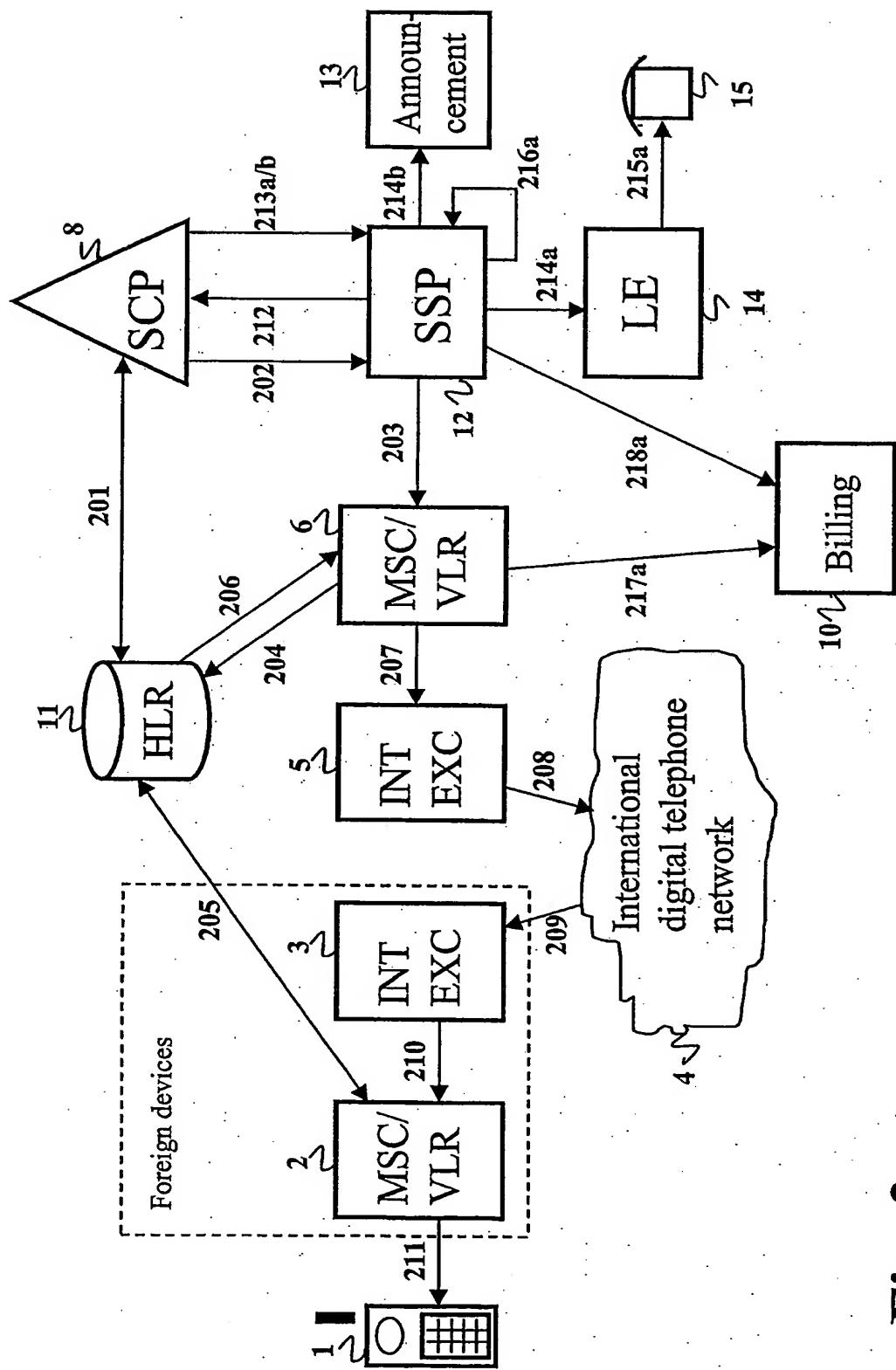


Fig. 2

INTERNATIONAL SEARCH REPORT

I al application No.
PCT/FI 01/00660

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04M 3/42 // H04Q 7/22
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04M, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0952723 A2 (SIEMENS INFORMATION AND COMMUNICATION NETWORKS INC.), 27 October 1999 (27.10.99), abstract, "Summary of the invention"	1,8,12
X	US 5550899 A (MCLEOD ET AL), 27 August 1996 (27.08.96), column 3, line 58 - column 4, line 63, abstract	1,13
Y	---	2
Y	US 5694459 A (BACKAUS ET AL), 2 December 1997 (02.12.97), "Summary of the invention"	2

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
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- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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- "&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 01/00660

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0873026 A1 (ALCATEL ALSTHOM COMPAGNIE GENERALE D'ELECTRICITE), 21 October 1998 (21.10.98), abstract --	1-14
A	EP 1045609 A1 (NOKIA NETWORKS OY ET AL), 18 October 2000 (18.10.00), abstract, "Background of the invention" -----	1-14

INTERNATIONAL SEARCH REPORT

Int'l application No.
PCT/FI 01/00660

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
EP 0952723 A2	27/10/99	US	6249576 B	19/06/01
US 5550899 A	27/08/96	AU	654280 B	03/11/94
		AU	679135 B	19/06/97
		AU	3610097 A	04/12/97
		AU	7791191 A	11/11/91
		AU	8162894 A	09/03/95
		CA	2078802 A,C	24/10/91
		CA	2222659 A	24/10/91
		DE	69130609 D	00/00/00
		EP	0527855 A,B	24/02/93
		EP	0849961 A	24/06/98
		JP	8506937 T	23/07/96
		JP	10229458 A	25/08/98
		US	5222120 A	22/06/93
		US	5555290 A	10/09/96
		WO	9116779 A	31/10/91
US 5694459 A	02/12/97	CA	2128306 A,C	15/03/95
		CN	1110032 A	11/10/95
		EP	0643541 A	15/03/95
		JP	7203081 A	04/08/95
EP 0873026 A1	21/10/98	AU	731971 B	12/04/01
		AU	6061998 A	15/10/98
		CA	2231289 A	14/10/98
		JP	11045181 A	16/02/99
EP 1045609 A1	18/10/00	AU	3969800 A	02/11/00
		WO	0064210 A	26/10/00